

## Observations of sea birds nesting on islands of the Sudanese Red Sea

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Between mid-May and the end of June 1976, we visited the Suakin Archipelago, the largest group of islets along the Red Sea coast of Sudan, which extends southwards from the ruined port of Suakin ( $19^{\circ} 30' \text{N}$ ,  $37^{\circ} 25' \text{E}$ ) almost to the Ethiopian border. A month later, at the end of July, we briefly visited some of the islets further north, off the fishing village of Mohammed Qol ( $20^{\circ} 53' \text{N}$ ,  $37^{\circ} 09' \text{E}$ ) (Fig. 1, insert). Our purpose was primarily to record species and numbers of nesting turtles, but we also made observations of the birds inhabiting or breeding on the islands.

There are c. 30 islets in the Suakin Archipelago (Fig. 1), all waterless and uninhabited. Most are less than 1 km long, although 2—Talla Talla Saghir and Talla Talla Kebir—are 5 km long. Some of the larger islets are rocky and reach a height of 10 m or more, having been formed from raised coral reefs, but are largely barren, with low vegetation growing only on the sandy fringes. On the smaller islets, too, fossil reefs are sometimes evident, but they are mostly low (1–3 m) and sandy, with only halophytic bushes growing on them, and fringed by a coral reef.

Five species of terns were observed nesting, or appeared about to nest: the Noddy *Anous stolidus*, the Swift (or Greater Crested) Tern *Sterna bergii*, the Lesser Crested Tern *S. bengalensis*, the White-cheeked Tern *S. repressa*, and the Bridled Tern *S. anaethetus*. Their nesting distribution and approximate numbers are shown in Table 1. No breeding by terns was observed on Karb, Loka, Hindi Seil, and Talla Talla Saghir. The last named is the largest of the Suakin islets, and the absence of terns was possibly due to rodent infestation.

### BREEDING TERNS

#### BROWN OR COMMON NODDY *Anous stolidus*

The discovery of the Noddy apparently breeding on Barra Musa Saghir came as a surprise, as there appears to be no other definite record of breeding of this dark, pelagic tern so far north (c.  $19^{\circ} \text{N}$ ), at least in the Ethiopian region. White (1957) does record the subspecies *plumbeigularis* breeding on islets in the Red Sea, the Gulf of Aden, and off Kenya, but gives no more detail, nor the source; Sclater's 'Systema' (1930) says only "*Distr.*—Red Sea and Gulf of Aden".

Sharpe (1879) described a specimen from the Red Sea as a new species, *A. plumbeigularis*, being "very much smaller (than *stolidus*); feathers in front of the eye black; wing not exceeding 9.5 inches, cheeks and throat sooty-grey, like the neck". Subsequent writers, including White, relegate the form to doubtful subspecific status. We were unable to examine the individuals on Barra Musa Saghir closely, but obtained a photograph. Nevertheless, it seems inherently unlikely that much genetic isolation could be attained by such a wide-ranging, oceanic species, apparently with somewhat vagrant habits (see, for instance, Archer & Godman's (1937) account of the disappearance of the large breeding colony from Mait Island, Somalia, earlier recorded by von Heuglin).

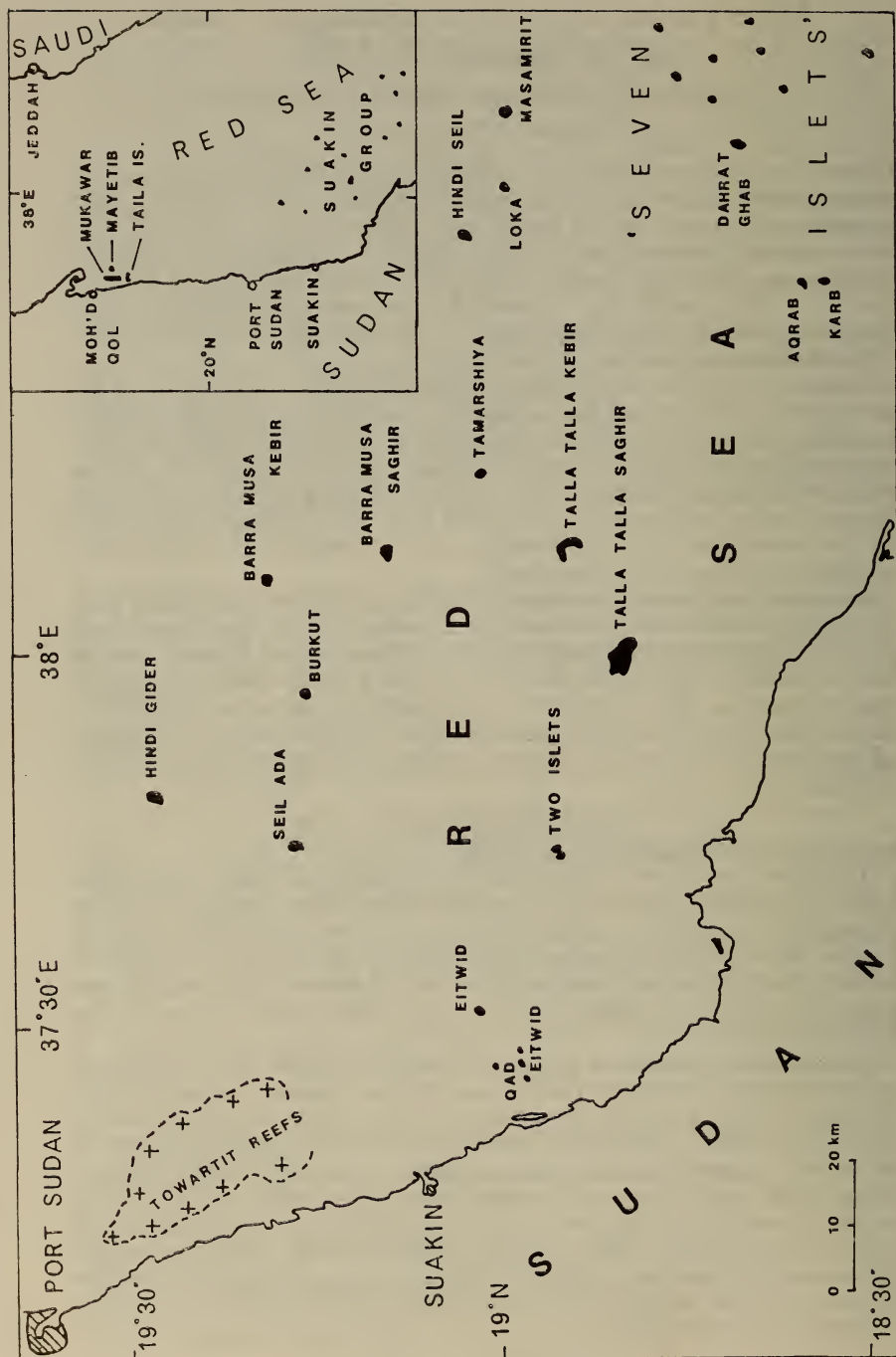


Fig. 1. Map of Suakin Archipelago. Insert - map of central Red Sea.

Table 1. Distribution and approximate numbers of pairs of breeding terns off the coast of Sudan, May - July 1976 (see Fig. 1).

	<i>Anous stolidus</i>	<i>Sterna bergii</i>	<i>Sterna bengalensis</i>	<i>Sterna repressa</i>	<i>Sterna anaethetus</i>
MOHAMMED QOL AREA					
Mayetib				100	
Mukawar			800	300	
Taila Islets			900	200	800
SUAKIN ARCHIPELAGO					
Hindi Gider			?	20	
Seil Ada			400		300
Barra Musa Kebir			?		
Burkut			?		
Barra Musa Saghir	300				300
Qad Eitwid Islets		10	150*	200	
Eitwid		10	200	100	200
Two Islets		300		100	400
Talla Talla Kebir				50	400
Masamirit			?		?
Aqgrab		50			
Seven Islets Group			?		?

Notes. \* observed in August 1977.

? indicates birds observed but not obviously congregating prior to nesting.

Mackworth-Praed & Grant (1957) describe *plumbeigularis* as "essentially a bird of rocky islets and cliffs", based on records of its nesting on Mait Island and Socotra, off Somalia in the Gulf of Aden. Our observations, and those of Britton & Brown (1974), indicate a greater variety of nesting habitats, a common characteristic being inaccessibility. In much of its range, *A. stolidus* builds a fairly substantial nest of seaweeds and twigs in trees and shrubs.

The colony, of c. 300 pairs, on Barra Musa Saghir was the only one seen on the whole of the Sudanese coast, and was found in mid-June. The birds were in breeding plumage and were the most aggressive of the 5 species of terns we observed. The nests were not examined as they were rather inaccessibly placed in thick shrubbery, 3 m high, growing in the centre of the island, and we had insufficient time to penetrate it. Active nesting is therefore only presumed, but the very aggressive 'dive-bombing' by the Noddies and their breeding colouration make it almost certain.

#### SWIFT (OR GREATER CRESTED) TERN *Sterna bergii*

Breeding was concentrated in the south of the Suakin Archipelago, no nests being found in the Mohammed Qol group, and thus Suakin may represent the northern breeding limit in the Red Sea. It is notable that all the islets which supported nesting colonies of *S. bergii* were less than 30 km off-shore, on the edge of the continental shelf, rising from water less than 50 m deep. This distribution could be related to specialised feeding habits, but no observations of feeding behaviour were made.

The greatest number were nesting in June on one of the Two Islets, where 2 distinct colonies, each of c. 150 pairs, were found on separate parts of the islet. Breeding did not appear to be synchronised between the 2 colonies, as



c. 50% of the eggs of one colony had already hatched, while none had in the other. On Aqrab, Eitwid and Qad Eitwid only single colonies, of 50, 10 and 10 pairs respectively, were found.

The colonies were densely-packed, on open sandy beaches. The nests, consisting merely of a slight depression in the sand, nearly all contained C/1, none more than C/2. The birds were very timid and were continually harassed by Sooty Gulls *Larus hemprichii*; as soon as they left their nests on being disturbed, a gull would swoop in, pick up an egg in its beak and make off with it. During the theft, the undisturbed terns would present only a very passive defence and did little to drive away the gull apart from calling loudly.

The Swift Tern's eggs thus appear to be rather vulnerable to predation by gulls, despite the bird's large size. It is possibly for this reason that, on several occasions, we found a colony of less than 10 pairs (not recorded in Table 1) nesting in the middle of a colony of one of the other species nesting on open sand, namely the Lesser Crested and White-cheeked Terns. These latter species are much more active in defending their eggs, and Swift Terns nesting in their midst would seem likely to benefit from such behaviour.

#### LESSER CRESTED TERN *Sterna bengalensis*

Mackworth-Praed & Grant (1957: 431) describe the Red Sea race *S. b. par* as having a "wholly yellow" bill, while Cave & Macdonald (1955: 158) call it orange-yellow. The birds we observed breeding had bright orange beaks.

The Lesser Crested Tern is probably the commonest tern on the Sudanese coast, but as they appear to breed somewhat later than Swift Terns, we found no nests until the end of July, off Mohammed Qol. On Mukawar we found a single colony of c. 800 pairs, and on each of the outer 2 Taila islets were single colonies of c. 450 pairs. However, birds were clearly preparing to nest on Seil Ada and Eitwid in the Suakin Archipelago in the middle of June, and it is likely that they nest there on many other islands as well.

The colonies were dense, with nests separated only by pecking distance. The nests, like those of the Swift Terns, were only slight depressions in the sand, but the choice of site was different, namely a preference for an open sandy area at the highest point of an islet, sometimes at its centre and surrounded by low bushes, sometimes on a slightly raised part of the beach. Although they were also subject to attack from gulls, and occasionally suffered losses of eggs, the Lesser Crested Terns actively drove away gulls which ventured too near the nesting colony.

In August the following year (1977) we visited one of the Qad Eitwid Islets and found a colony of several hundred Lesser Crested Terns with their young. The fledglings were grouped in a crèche of c. 150, attended by c. 20 adults, as found in some other crested terns (Buckley & Buckley 1972). The fledgling plumage was a uniform light grey with darker grey blotches on the wings.

#### WHITE-CHEEKED TERN *Sterna repressa*

The type specimen of this species was collected by Hartert in Suakin.

We noted considerable variation in the colouration of the beak and legs, ranging from wholly dark red, through black and red, to all black. In the fledglings the colouration is equally variable, but in them it appears to be part of an overall variation in the whole plumage, which displays camouflaging and disruptive patterns, basic colouration ranging from coral sandy-

white to sandy-brown or pale bluish-grey, while the markings (which may or may not be present) vary greatly in size, position and colour.

White-cheeked Terns nested in scattered colonies of any number from 5 to 300 pairs, often several to an island. Where colonies exceeded 50 pairs or so, they were often split into smaller, contiguous sub-colonies which nested asynchronously, separated by a week or so. On many occasions colonies of 5-50 pairs were found sited adjacent to a colony of Lesser Crested Terns, possibly to obtain protection from gulls in the same way as Swift Terns. There was great variation in nesting habitat and construction: some nests were on sand-spits and rocky outcrops; sometimes the nest was merely a depression in the sand; sometimes a variety of combinations of seaweed, twigs or coral rubble was used, when the nest might range from a perfunctory circle of material to a built-up structure several inches high. Clutches were most commonly single but up to 3 eggs were found, with very variable, camouflaging colour and markings.

#### BRIDLED TERN *Sterna anaethetus*

The Bridled Tern was present in loose colonies of several hundred pairs on most islands, both in the Suakin Archipelago and in the Mohammed Qol area, with fewest in the far south where they had not started nesting at the time of our visit in May. Breeding appears to start in early June off the south of Sudan, and nestlings were hatching out at the end of July in the north. They nest on sand protected by the low halophytic scrub which covers the centre of many of the islets. The scrub is patchy, so colonies were sometimes split, but eggs appeared to hatch synchronously within and between sub-colonies. The eggs were usually single (we never saw a larger clutch than 2), and the female sits or stands over it while the male stands guard on top of a shrub and drives away intruders. The plumage of the nestlings seen was a uniform pale sandy-grey with darker grey blotches on the wings.

#### Discussion

Apart from occasional collection of eggs for food by fishermen, the only predation on eggs or young observed was by 2 gull species, the Sooty Gull *Larus hemprichii* and the White-eyed Gull *L. leucophthalmus*. Each tern species appeared to have distinct defensive methods against attacks by gulls, with varying degrees of success. The Noddy nests in thick shrubbery which may be more inaccessible to ground predators than to aerial ones, but the bird's extreme pugnacity is sufficient to repel predators far more aggressive than gulls. The nest of the Bridled Tern is well protected under low scrub and is guarded carefully by the parents. The Lesser Crested Tern forms large, closely packed colonies, with nesting terns, as mentioned above, separated from each other only by pecking distance. Intruding gulls were actively driven away. The Lesser Crested and Bridled Terns appeared to select nesting sites of uniform type, and the individuals of each species within each colony appeared to nest synchronously, a habit which can reduce predation by shortening the length of time available to predators for attack (Cullen 1960).

Breeding of Swift Terns and White-cheeked Terns in subcolonies on an island was asynchronous, possibly reflecting their greater vulnerability to attacks on their eggs by gulls, since both species nest on sites unprotected by dense vegetation and seem unable to defend their nests well, the White-cheeked Tern owing to its small size and the Swift Tern because of its extra-

ordinarily passive and ineffective behaviour. Both, however, as noted, also nested in association with colonies of Lesser Crested Terns, probably thereby gaining protection and higher breeding success (cf. *S. sandvicensis*—Cullen 1960, Lind 1963). In contrast to the first 3 species discussed here, the locations of whose nests were obvious but well-defended, breeding White-checked Terns were inconspicuous. It is the smallest of the 5 species, its plumage is relatively drab, its nests are more widely scattered over an island and the camouflage of the eggs is preserved by defaecation away from the nest. Though the threat of predation extends over a longer period due to asynchronous nesting, the risks are reduced by spread over a number of small sub-colonies. As described earlier, there is a wide variation of nestling colouration, so that some young inevitably would be well camouflaged against the local background.

Apart from sometimes nesting in association with other tern species, the Swift Tern's poor defence against gulls resulted in significant losses of eggs. This is possibly an edge-of-range effect on the species, since it breeds in the Arabian Gulf, and probably in the more southerly islands of the Red Sea, in very large dense colonies, like the Lesser Crested Tern. In doing so, selection for camouflage may have become relaxed, so that eggs and young are more uniform in colouration, and the need to defaecate away from the nest is removed (Cullen 1960). Both Swift Terns and Lesser Crested Terns left rings of guano round their nests, which must have made the Swift Tern's small colonies in the Suakin group more vulnerable to gull predation.

#### OTHER BREEDING BIRDS

##### SOOTY GULL *Larus hemprichii*

Almost invariably present in small numbers on every island. We found it nesting in isolated pairs on low-lying islets, although up to 100 birds were seen and presumed to be nesting on the cliffs of Mukawar in July.

##### WHITE-EYED GULL *Larus leucophthalmus*

Seen in similar numbers to *L. hemprichii* on Mukawar. Although Mackworth-Praed & Grant (1957) report it as breeding in large numbers in the Gulf of Aden, we did not see it south of Eitwid Islet in the Suakin Archipelago.

##### BROWN BOOBY *Sula leucogaster*

Brown Boobies, singly or in pairs, usually accompanied us when we arrived at, or left, an island, but we did not see any nesting. There were several hundred on Dahrat Ghab (on which we were unfortunately unable to land) in the Seven Islets at the beginning of June, and it is very likely that this was a nesting colony. Mackworth-Praed & Grant (1957) report this species as breeding "as far north as the Farasan Islands" (c. 17°N, 42°E, off the Saudi Arabian Red Sea coast) in October and November and in "Suakin, Sudan, possibly June and July"—presumably the Suakin Islands.

##### CRAB PLOVER *Dromas ardeola*

Seen commonly in groups of 2–6 on the coast of the mainland and on islands less than 30 km off-shore. On Two Islets in mid-June we found several long burrows c. 20 cm in diameter, which footmarks indicated were



the nests of birds with partially webbed feet. We could not wait long enough on the island for the birds to appear, but they were almost certainly the nest burrows of the Crab Plover, which are "generally some five feet long" (Mackworth-Praed & Grant 1957).

#### OSPREY *Pandion haliaetus*

Present on nearly every islet, the larger islets being inhabited by several pairs. Breeding occurs January to April, but their nests—often impressive structures of twigs or other materials, built high on top of a mound or pile of stones—were conspicuous.

#### SOOTY FALCON *Falco concolor*

Present on many of the off-shore islets, apparently in breeding pairs, although we did not locate any nests. They noisily and aggressively drove away gulls, a larger raptor, and the authors, from their territory. Breeding occurs July and August.

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## Scaly-throated Honeyguide *Indicator variegatus* parasitizing Olive Woodpeckers *Dendropicos* *griseocephalus* in Malawi

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In the south-central African region, the Scaly-throated Honeyguide *Indicator variegatus* is a highly localized species, found either in tall *Brachystegia* woodland, or in patches of evergreen forest at low and high altitude (see e.g. Benson *et al.* 1971). While resident for 2½ years on the Nyika Plateau (Malawi-Zambia), I occasionally encountered this species in montane forest patches